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# Reported values of industrial arts.

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# REPORTED VALUES OF INDUSTRIAL ARTS

DACEY - 1940

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# OF

# INDUSTRIAL ARTS

by

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# TABLE OF CONTENTS

# TABLE OF CONTENTS

TABLE OF CONTENTS

## TABLE OF CONTENTS

TABLE OF CONTENTS

# INDEX OF TABLES

# LIST OF TABLES

# THE INTRODUCTION

# CHAPTER I

## INTRODUCTION

Industrial Arts is an area in general education in which an attempt is made to acquaint the individual with life experiences introduced to the classroom through the media of tools, processes and materials. While it presents technical knowledge and develops manipulative skill it is not purely vocational in nature but subscribes to the broader cultural aims of general education. The industrial activities presented are not ends in themselves but are a means through which the pupils are prepared for more complete participation in life.

Knowledge of the historic background of any subject is essential for the fullest appreciation and evaluation of its significance in a curriculum. The progress of Industrial Arts since its adoption in the United States has been swift, successful, and judging by the results of immediate objective tests, very effective.

(1) Early History of the Industrial-arts Movement -- The forerunners of Industrial Arts date

back to the beginning of known history. Through all ages boys have eagerly watched their elders and imitated them. By so doing they have become the next generation of working men. Civilization would not have progressed to its present high level had the first fumbling activities of its boys been curbed.

The savage learned handwork by unconscious imitation. Skill of hand in the primal activities of his time was his great source of power over his environment. Savage education consisted of learning how to obtain the necessities of life for self and family. It was not of a school but gained through the social life of the family or tribe.

Social value of handwork was emphasized by the ancient Jews. The custom was for the boy to go to school in the morning where he was taught by the Rabbis, and to remain at home in the afternoon learning the trades of his father. The Talmud contains the following statement:

"Beautiful is the intellectual occupation if combined with some practical work." Thus was presented the beginning of comprehensive education.

The teaching of the arts was carried on through-out the later years by the Greeks, who taught slaves the crafts; by the Romans, who trained slaves also, but who inaugurated specialized labor; by the Christian monks, --"after having celebrated the praises of God seven times a day, seven hours a day should be given manual labor and two hours reading;"[1] and by Luther who said, "--we must send the boys to school one or two hours a day, and have them learn a trade at home for the rest of the time."[2]

Rabelais thought children should learn the industries through vicarious experiencing, "They went likewise to see the drawing of metals, the casting of great ordinance; -- and did learn and consider the industry and invention of the trades."[3] Comenious favored try-out courses, "boys

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[1] Rule of Saint Benedict

[2] Monroe, Paul, A Textbook in the History of Education, New York, MacMillan, 1907, p.413

[3] The Works of Francis Rabelais, Translated from French by Sir Thomas Urquhart and Matteaux, London, Henry G. Bohn, 1864, p.183

would discover their special aptitudes if, in addition to academic subjects, they were given instruction in the mechanic arts."[4] John Locke believed that the "chief value of education lies not in the content or subject learned or skills acquired, not in the thing learned, but in the process of learning."[5] Rousseau believed, "If instead of making a child stick to his books I employ him in a workshop, his hands labor to the profit of his mind, he becomes a philosopher but fancies he is only a workman."[6] Cygnaeus of Finland proposed that manual training should be adopted in the public schools of his country.

(2) Introduction into the United States -- In 1825 a so-called Manual Labor Movement was introduced in America. This novel educational idea was sponsored by a group of progressive educators who were inspired by the success of the academy, founded by Fellenburg, near Berne, in Switzerland. Manual labor, later called handwork, was classed educationally with

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[4]Keatinge, M. W., The Great Didactic of John Amos Comenius, London, Adam & Charles Block, 1896, p.421

[5]Locke, John, "Some Thoughts Concerning Education," The Library of Education, I, Boston, Mass., p.492

[6]Rousseau, Jean Jacques, "Oeuvres Completes," Tome III, p.348, Dalibon Libraire, Paris

physical training and was considered an aid to health in Fellenburg's academy because the students were wealthy and did not expect to earn their living. But in a farm school or "poor school" which was organized by one of his assistants slightly later, the students, who were poor, engaged in handwork on a production basis to pay for their tuition and board. In democratic America an incorporation of the two plans was accepted for use in 1829. The school first trying the "experiment" was the Andover Theological Seminary at Andover, Massachusetts. The Seminary erected and equipped a workshop for instruction in soap making and cabinet making. The pupils worked in the shop one and one-half hours per day. The results were favorable judging both by improvement in health of the pupils and the pecuniary return to them.

Worcester Polytechnic Institute had some elementary beginnings in mechanic arts. The University of Illinois had shops for woodworking and iron working for students of architecture and engineering. Stevens Institute and Washington University

organized similar shops at a later time.

Industrial Arts varied as to form and presentation through the years as the various educations of the world influenced it beneficially or detrimentally until it was introduced, in the nearest to its present form, in the United States by Professor John D. Runkle of Massachusetts Institute of Technology in 1876. At that time it was known as the "Russian Experiment" because it was patterned after a system used for apprentice training in the government railroad shops of Russia. The noted St. Louis Manual Training School was opened in 1879 and, from this time, the subject, as such, was gradually given recognition in all the cities of United States.

Industrial Arts, then, as a subject in the public schools of the United States, may be considered relatively new. Being new, only a limited amount of research and testing has been carried on by any one in that field. Its newness, in turn, may account for differences existing in the kind and presentation of content. No one philosophy of Industrial Arts has been

accepted as being true, accordingly, great benefit should be derived from the elimination of all unsound theories and practices used in the schools of today and the standardization of scientifically tested programs.

(3) Treatment in the United States -- Until recently, comparatively little interest has been shown among industrial-arts teachers in attempting to solve educational problems scientifically. However, this attitude on the part of some industrial-arts teachers is changing. They are beginning to realize, as never before, that there are many problems to which an answer must be found before real progress can be made. The "guess" must be taken out of industrial-arts education and science must combine with philosophy in order that the subject be made most effective.

There are some who question the value of research in Industrial Arts; but its need is quite apparent if one but noted some advances which have been made in academic fields because of research. Pupils now learn to read the printed page in a fraction

of the time it took children two decades ago, all because research workers attacked certain problems in reading and discovered a new and vastly improved method of teaching the art. It may be that the present methods of teaching Industrial Arts are cumbersome and inefficient and the subject matter obsolete and worthless. The total value which can come from such research can never be adequately measured.

(4) The Author's Motive for Writing This Thesis -- To date many problems which confront shop instructors have been completely or partially solved satisfactorily but the solution of many are sought at this time. It is the author's pleasure to carry on research to ascertain the social or carry-over value of industrial-arts training as outlined by recognized contemporary authorities on the subject.

# BACKGROUND

# FOR

# INDUSTRIAL ARTS

# CHAPTER II

## BACKGROUND FOR INDUSTRIAL ARTS

In order that an educational dissertation may be fully appreciated and understood the underlying philosophy on which the whole scheme is based must be clearly defined with consideration for the curriculum as a whole, and its integral parts.

(1) General Statement of Purpose for Education -- In the United States it is generally conceded that the public school is a social institution operated for all children so that they may share in the intellectual and social heritage of the country and by so doing develop individually to the fullest extent of their natural capacities, and adjust themselves to their environment. "The school has a dual function: it must aid each person in attaining a more perfect individuality and happiness, and it must socialize him."[7]

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[7] Arnold, Joseph I., Problems in American Life, Evanson, Illinois, Row, Peterson & Co., 1928, p.200

The basic purpose of education is to develop girls and boys into happy, useful, and successful citizens. Such a life involves the possession of certain desirable ideals, attitudes, habits, and accomplishments. It is toward the development of these behavior patterns that our efforts must be directed.

Teachers should foster desirable traits and work out favorable changes in the individual pupil, and do it in the most effective way. It is first necessary to know what the most desirable ideals, attitudes, habits and accomplishments are, and then provide experiences for the specific purpose of bringing about the desired reactions. It is known that every change in the individual -- good or bad -- must come through experiences and their interpretations; therefore, if a certain change is sought, experiences must be chosen and interpretations provided which promise to bring it about most effectively.

(2) Philosophy for Entire Educational Scheme -- A philosophy of education outlines in terms of principles, theories, and opinions the purposes,

proposals, and general limitations of the educational offerings of the schools within its jurisdiction. The multiple aims of education were conceived for schools in their entirety, with no particular reference to curricula, subject-matter ranges or individual subjects. They are broad in scope, and allow for latitude of the full educational program. Approved educational offerings include subjects in the curriculum and extra-curricular activities. These, in their total are assumed to contribute to the complete education of the child; including his mental, moral, emotional and physical growth, in the light of contemporary mores and commonly accepted behavior patterns.

(3) Aims of General Education with Consideration for Individual Subjects -- The aims of general education are wide in scope inasmuch as society through its accepted principles and approved educational desires, indicates only the expected general outcome without specific limitations. Therefore, it seems logical that any subject aims should be conceived in terms of specific contributions to the realization of

general aims and that there be clear lines of demarcation in types of action for particular courses of study.

(4) Quotation From Contemporary Educators -- Verns G. Fryklund and Earl L. Bedell[8] make the following suggestions;

"There are three suggested steps in formulating subject aims in order that they will mark the end toward which instruction in a particular subject should move, and so that such instruction would make its fullest measure of contribution to the aims of general education.

a. A set of aims for general education should be agreed upon and stated, and their principles should be studied by all who are concerned with the problem of course building or revision.

b. A set of aims for the subject-matter area, or field (such as the field of

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[8] Fryklund, Verns G., and Bedell, Earl L., "Course of Study Construction in Industrial Education," Industrial Arts and Vocational Education; XXVII, (September, 1939), p.p.261-263

industrial education) should be conceived by analyzing the general aims and making new ones to determine the emphasis of the field contribution. This set of aims is not assumed to be conceived for any particular subject but marks the end toward which instruction moves in all the subjects of the field. These aims would be narrower than those for all education but too broad for use as subject aims.

c. A set of aims for the subject should be conceived by analyzing the aims of the subject-matter field and by making new ones to determine the fullest contribution that could be made by instruction in the subject. These aims should be definitely stated, and they should serve as working aims for building the course of study. Contributions to the realization of these aims are contributions to the realizations of the aims of general education."

In addition the same co-authors make the following deductions:

"Functions of Aims; The aims of a subject have several important functions. First,

they harmonize the work in a subject with the aims of general education. Second, they indicate the end toward which instruction should move. They help the teacher to determine the proper direction and to keep instruction within bounds. Third, they help the teacher to determine when the desired end of instruction in the subject is reached. Fourth, they serve as a guide in determining what content shall be chosen, which when accompanied by good instruction, will make the best contribution to realization of aims. Any content that would not contribute to desired ends should be rejected. It is difficult to know what concept to accept or reject unless aims are definitely stated. Fifth, the aims of a subject are necessary in order to determine what methods of instruction ahould be employed in order to present content. Proper instructional emphasis in terms of desired ideals, attitudes, appreciations, and skills would be difficult without subject aims. Sixth, they indicate the nature of apprais-ed procedures that should be employed in evaluating outcomes. They are of great help in the setting up of

objectives for constructing examinations and for evaluating results. Tests are important for determining when the aims have been attained."

(5) Justification for Subject Aims -- Subject aims require the most serious consideration, for without them, no pedagogical procedure is directional. A natural next step would be selection of content. Analysis of local industrial activity and present and potential physical equipment of school should precede choice of subject matter. Methods of presentation vary with the individual differences of teacher and student personnel. It is difficult to prescribe a specific method or combination of techniques, but the most commonly used methods are: lecture-demonstration; discussion; written instructions (job sheet) with explanations; observation; trial and error. The latter mentioned is usually due to evolution rather than to resolution.

(6) Integral Part Allotted to Industrial Arts -- Industrial education shares in this service and, in consequence, is an integral part of the

general scheme. The aims of education determine for industrial education, as for other fields, the specific contributions expected from it by society. Therefore, in organizing a course of study in an industrial education activity, the aims of general education must be given initial consideration. The activities should be so patterned that they bring about the fullest realization of the aims of general education.

(7) Justification for the Aims of Industrial Arts -- Reflective thought, or reasoning, and lack of strong instinctive urge, and the designing use of tools to aid in construction, are the principal activities which distinguish men from the lower animals, and much of such thought is concerned with planning and doing. Creative thought is essential to man's progress; creative doing is essential to his life and comfort. The experiences in the academic field are designed primarily to encourage the accumulation of facts and development of reasoning; the experiences in the industrial-arts field are designed primarily to develop the ability to plan wisely and constructively,

which also involves reasoning, and use of tools.

Industrial Arts, because of the valuable mediums used in the manipulative processes develops self-confidence and initiative. Because it necessitates the use of materials unnecessary to the presentation of academic subjects it offers and gives opportunity for the study of those mediums and their uses in life.

(8) Illumination in Regard to Industrial Arts -- Industrial Arts is one of a small group of so-called laboratory subjects which are unique in that they require not only the acquisition of a body of knowledge, but the development of manipulative skill. The pupil must be tested on what he can do as well as what he has learned or both simultaneously. Usually the greatest difficulty is in the simultaneous expression of fundamentals.

Projects must be chosen and arranged in sequence with consideration for progression of general knowledge; acquaintance with physical equipment and materials of construction; various methods and

types of construction; co-operation of types of construction with corresponding materials, with consideration for use of proposed product; and with all development of manipulative skill in use of shop implements and recognition of proper disposition of all problems.

(9) Weakness in Universally Used Tests -- One factor which greatly retards our present progress toward a well-balanced system of education, which would give due emphasis on the various aims, is the tendency to overemphasize the so-called objective test. The objective test, in its present development, measures only detailed factual material and subject matter skills. There have been few attempts, and fewer satisfactory results, in the measurement of ideals, attitudes, and habits of thought and practice. At present the objective test places too much emphasis upon immediate response to learning processes. Valuable as such tests are for the purpose for which they were designed, intensive use of them tends to obscure the other values of our educational program. If a teacher is to be rated on the basis of his success in preparing pupils to make

a high score in factual tests, subject matter or manipulative skills, he is not likely to give much attention to the other long-range results of education.

Just as these academic teachers often err by forming a habit of emphasizing only the facts and the fundamental processes, so the industrial-arts teacher is likely to blind himself to all else but emphasizing skills and the making of things, and neglect to avail himself of the exceptional opportunity offered for developing those traits which contribute so much to good citizenship and worthy home membership.

(10) Suggestions for Improvement of Testing Program -- Direct results of teaching Industrial Arts may be measured objectively in the light of intended aims of informational outcomes, observation of class work, or inspection of finished project. Ideals, attitudes, and appreciations may be evaluated with little more difficulty objectively, as above, or subjectively through judgement of pupil reaction. The

greatest difficulty lies in the evaluation of concomitant learnings, carry-over benefits of the course, character training and general social values of the course. Teachers in all fields, including Industrial Arts, are very desirous of knowing the results of the after school value of the various subjects taught by them.

# R E L A T E D  L I T E R A T U R E

# I N

# I N D U S T R I A L  A R T S

# CHAPTER III

## RELATED LITERATURE

Trends in any subject are best revealed through the writings of the thinkers in that field. The group quoted herein are generally accepted as being the outstanding authorities on Industrial Arts, and accordingly their theories should form a basis for a comparison of value. The listing is restricted to a summation of their ideas as to the objectives of Industrial Arts.

(1) Consensus Credo in Regard to Industrial Arts by the Practical Arts Faculty of the State Teachers College, Fitchburg, Massachusetts[9] --

a. Practical help in understanding our industrial civilization.

> An acquaintance with the many phases of industrial life and the problems of living and working; an appreciation of industrial products, and a sympathetic understanding of the social conditions of industry and labor.

b. Guidance

> Exploration through varied experiences leading to an appreciation of

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[9]Pamphlet Published in 1937

the interests and aptitudes of individual pupils and such counseling as will aid them more wise to choose and prepare for their life work.

c. Consumer Training

Studying the basic industrial materials, the relative merit of different materials which may be used for the same purpose, the design, workmanship, and costs of commercial products and their intelligent use.

d. Avocational Enrichment

Opens a broad field for hobby and leisure time selection through varied experiences and wise counseling.

e. Handy-man Experience

Development of fundamental knowledge, skills, and experiences so that the pupil may aid in keeping in good repair, the appliances, furnishings, and the home itself.

f. Citizenship Training

Capitalization of the many opportunities provided by creative work to inculcate the traits of good citizenship, honesty, obedience, initiative, co-operation, and throughness. Insistance on standards of good workmanship provides very useful experiences in being a good citizen.

g. Vitalizing the 3 R's

Providing the best possible illustrative material for much of the abstract work which has to be covered in the middle and upper grades, extending the use of facilities in the development of the so-called Activities.

h. Creative Self-expression

Planning, designing, and excuting projects of the pupil's own choice in which a freedom of expression is coupled with an application of the necessary skills and information, maintaining close supervision and guidance without stifling the initiative of the boy.

(2) Laurence Parker,[10] Kansas State Teachers College, Pittsburg, Kansas.

a. Trade.

b. Appreciation of craftmanship and being a good consumer.

c. An aid to resourceful constructive thinking.

d. Development of work habits.

(3) Arthur Feuerstein,[11] Rogers High School, Stamford, Connecticut.

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[10] Parker, Laurence, "The Relation of Industrial Arts to Vocational Education," Industrial Arts and Vocational Education, XIX (June, 1926), p.p.211-213

[11] Feuerstein, Arthur, "An Argument for Industrial Arts in the School Curriculum," The Industrial Arts Magazine, XV (June, 1926), p.p.189-192

a. To afford the boy a means of expressing his ideas in some useful way.

b. To give the boy an opportunity of working and mingling with his associates.

c. To give him a knowledge of the uses of the common tools.

d. To give him an idea of the possibilities of various trades and industries.

(4) Robert E. Smith,[12] Ohio State University, Columbus, Ohio,

a. Explorational objective.

b. Achievement of manipulative object.

c. Achievement of aesthetic appreciation.

d. Consumer knowledge and appreciations.

e. Development of desirable personal traits and attitudes.

(5) William E. Warner,[13] Ohio State University, Columbus, Ohio.

a. The principle of orientation and what it means.

b. The nature and need for recreational outlets.

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[12] Smith, Robert E.; "Teaching Methods which Increase Industrial Arts Achievements," Industrial Arts Magazine, XXVII (May, 1938), p.p.185-188

[13] Warner, William E., President American Industrial Arts Association, Pamphlet presented at a meeting of the Hampden County Teachers Association, 1939

c. The challenging requirement of consumer literacy.

d. The obligation to youth for providing technical mastering.

e. The social effect of an experience curriculum.

f. The cultural ideal and particularly as regards materials.

(6) F. G. Bonser and L. C. Mossman,[14] Teachers College, Columbia University, New York City.

a. Be aware of general health needs.

b. Be able to buy and use industrial products of good quality.

c. Love that which is beautiful.

d. Be sensitive to the well-being of industrial workers.

e. Have permanent interests in materials, processes, products, and achievements of industry.

f. Be reasonably dextrous in handling materials, tools, machines, and products found in general environment; be capable of doing or directing the simple kinds of repair work relating to clothing; and the household where the specialist is needed; and have such qualities as accuracy, neatness, and persistence reasonably

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[14]Bonser, Frederick G. and Mossman, Louis C., Industrial Arts for Elementary Schools, New York, MacMillan Company, 1938, p.p.7-16

well developed with reference to their application to use or upkeep of industrial products. These are the outcomes incidently developed through the appropriate realization of the primary outcomes.

(7) Homer J. Smith,[15] University of Minnesota, Minneapolis, Minnesota.

Industrial education permits of a great variety, not alone of types of schools and classes but of basic personal and group contributions. It affords acquaintance, exploration, preparation, retraining and marginal facility. It provides recreational outlet for some and furnishes sorely needed and salable skills for others. It offers useful knowledge, cultural appreciation, and worthy work interests and attitudes. Industrial education helps to solve the home problems of workers. It is good sociology and good economics as well as good education.

(8) Louis V. Newkirk,[16] Iowa High School, University of Iowa, and George D. Stoddard, Associate Professor of Education and Psychology, University of Iowa.

a. Developmental experience interpretative

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[15] Smith, Homer J., "Aims and Types of Industrial Education," Industrial Arts and Vocational Education, XXVII (February, 1939), p.p.86-89

[16] Newkirk, L. V. and Stoddard, G. D., The General Shop, Peoria, Illinois, The Manual Arts Press, 1929, p.p.11-13

of the major phases of the world's industrial work.

b. "Handy-man Activities."

c. Consumer's knowledge and appreciation.

d. Guidance.

e. Hobbies.

f. Social habits.

g. Vocational preparation (very small percent)

(9) R. M. Selvidge,[17] University of Missouri, Columbia, Missouri.

a. A well-developed interest in industrial affairs.

b. A knowledge of some of the elementary principles of science that effect the functioning of things we use.

c. An appreciation of good workmanship and good design.

d. An attitude of pride or interest in his ability to do things.

e. A feeling of self-reliance or confidence in his ability to take care of himself in an unusual situation.

f. A habit of orderly and methodical procedure in performance of any task.

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[17] Selvidge, R. M., "What Shall We Teach," Industrial Education Magazine, XXI (August, 1929), p.p.212.

g. Elementary skills in the use of the more common tools and machines and in methods of modifying and handling materials, in order to make them conform to our use.

(10) William H. Mulvey,[18] LaSalle-Peru Township High School, LaSalle, Illinois.

Industrial Arts should give the student industrial experiences, but it should also contribute to his general understanding of industry and industrial organization.

The real objectives of the industrial-arts course are to assist in the student gaining:

a. Health,

b. Command of fundamental processes,

c. Worthy home membership,

d. Vocation,

e. Citizenship,

f. Worthy use of leisure,

g. Character.

(11) David Snedden and W. E. Warner,[19] Teachers College, Columbia University, New York City.

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[18] Mulvey, William H., "Proposed Reconstruction of Industrial-arts Courses in Secondary Schools," Industrial Arts Magazine, XXXI (April, 1928), p.p.115-121

[19] Snedden, David and Warner, W. E., Reconstruction of Industrial-arts Courses, 1927, New York Teachers College, Columbia University, p.10

"------ developmental experiences through manipulative and other activities introductory to the various accessible phases of the world's industrial work;" and as secondary aims the activities implied in exploration, guidance, consumer's knowledge and appreciation, household mechanics, hobbies, vocational preparation (for a very small percent), correlation with other studies and social habits.

(12) Merrit Pease,[20] Springfield Township High School, Holland, Ohio.

a. Opportunity to explore, experiment, invent, and construct in an effort to satisfy self-expression.

b. Development of elementary skill in performing simple tool and machine operations.

c. Development of worthy attitudes, lofty ideals, discriminating appreciations.

d. To furnish the pupil with opportunities to gain knowledge and have experiences that will aid him in understanding his environment.

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[20] Pease, Merrit, "General Industrial-arts Laboratory," Industrial Arts and Vocational Education, XXXVII (March, 1928), p.p.124-127

e. Development of consumer's appreciation and knowledge.

f. Development of initiative, self-confidence, leadership, and cooperativeness.

g. To give vocational and avocational guidance.

h. Development of safety consciousness and habits.

(13) John F. Friese,[21] Pennsylvania State College, Pennsylvania.

A. Manipulative Aims:

a. To provide opportunity to make and do things they like to do and make,

b. To provide training in common skills everyone should possess,

c. To provide trade exploratory or try-out experiences in typical trades, or assist in finding and testing interests and aptitudes

B. Justifiable Non-manipulative Aims:

a. To provide training in industrial arts and industrial-art appreciation (partially manipulative),

b. To provide a natural medium for guidance, educational and vocational,

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[21] Friese, John F., "Exploring the Manual Arts," New York, Century Co., p.p.41-42

c. To provide interesting technical information about the occupation or occupations represented in a school shop and others closely allied,

d. To provide studies in vocational economics closely related to everyday life,

e. To provide organized training in reasoning and problem solving.

(14) Emanuel E. Ericson,[22] State Teachers College, Santa Barbara, California.

a. To give opportunities for satisfying the desire to do things with tools and materials.

b. To afford opportunities for exploring or trying out a variety of occupational fields through actual participation in the work represented by these fields, as a means of discovering occupational aptitudes.

c. To give experience with common tools and materials that will be generally useful to everyone ("handy-man activities").

d. To furnish a body of technical knowledge concerning industrial work and the materials used in industry.

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[22]Ericson, Emanuel E., "Teaching Problems in Industrial Arts," The Manual Arts Press, Peoria, Illinois, 1930, p.p.294-298

e. To lay a basis for intelligent selection and use of industrial products from the standpoints of both fitness and construction.

f. To develop an appreciation of the work of men who labor in the industrial world, and a wholesome attitude toward their tasks.

g. To present a field of possibilities for worthwhile leisure-time pursuits.

h. To widen the students' knowledge of occupations through auxiliary studies and related information.

i. To develop appreciation of economic relationships in industry and business through special study and productive experience.

j. To prolong the educational life of certain students who are encouraged by these special activities to remain in school, (vitalizing the educational program).

k. To give vocational and semi-vocational training to a limited group in order to meet the needs of those who will leave school at an early age.

(15) Six Speakers at Panel Discussion of Respective Goals of Industrial Arts and Vocational Education.[23]

Auspices of Massachusetts Industrial Education Society Meeting at Boston, February 8, 1936.

| | CULTURAL |
|---|---|
| a. To bring to pupils a realization of their better selves, better personal pride, and better relationships. | Pure ethics |
| Through manual activities to attract and to hold pupils to a profitable employment of time; to hold them in school. | Interest and discipline |
| To capitalize the liking of many pupils for practical rather than academic work and to develop power for abstract thinking. | Interest and academic education |
| b. To develop proper attitudes, work habits and appreciation of manual labor's contribution in the social activities of modern civilization. | Citizenship |
| c. To correlate intimately fine and industrial arts. | |
| To train in good design, and to improve the design quality of articles made in the shops. | Appreciation and utility of beauty |

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[23] Speakers.

Mr. Edwin H. Whitehill, Headmaster, Senior High School, Watertown, Massachusetts

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|---|---|
| | ECONOMIC |
| d. To develop, through planning, constructing and finishing useful articles, and appreciation for materials and craftmanship, and thus to make the individual a better purchaser of commercial products. | Appreciation of quality |
| e. To give a general knowledge of industrial processes, and, through the medium of basic occupations, to help the individual to see a cross section of industry and its relations. | Industrial sense and intelligence |
| f. To discover aptitudes which have poor opportunity for expression in the traditional school activities. | Vocational self-discovery |
| g. To establish a basic through information and experiences from which educational and vocational guidance and choice may come. While this should be essentially educational, it should also be broadly vocational. | Advisement, guidance and choice |

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[23]Speakers (con'd)

Mr. William T. Miller, Master, Washington Irving Intermediate School, Boston, Massachusetts

Mr. Walter H. Klar, Supervisor, Fine and Industrial Arts, Springfield, Massachusetts

Mr. Herman A. Pohlman, Instructor, Industrial Arts, Weeks Junior High School, Newton Center, Massachusetts

Mr. Thomas A. Roche, Vocational Coordinator, Industrial Cooperative School, South Boston High School, Boston, Massachusetts

Mr. Melvin V. Weldon, Director, Medford Vocational School Medford, Massachusetts

(16) Summary of Aims Proposed by Authorities -- A fair evaluation of an educational program must be based upon a comparison with a constant factor of recognized stability and sterling worth. In case of Industrial Arts the most trustworthy basis for a consensus opinion of successful industrial-arts teachers from other localities.

In every subject field there are people who, by the initiative they assume and by the success crowning their endeavors, distinguish themselves to the extent that they are recognized as authorities on the subject by all associated with that sphere of activity. The aims confirmed by such a group are tabulated in Table I.

(17) Interpretation of Aims Proposed for Industrial Arts by the Several Authorities -- An interpretation of the aims for Industrial Arts should facilitate an understanding of the terminology associated with it. The aims are divided into three general types: namely; manipulative, partially manipu-

TABLE I

Social Aids Attributed to the Subject by the Authorities Quoted in the Foregoing Pages and Their Frequency

| Stated Aim | Frequency |
|---|---|
| Appreciation of Industrial Problems | 6 |
| Exploration | 9 |
| Consumer Knowledge and Appreciation | 8 |
| Avocational (Hobby) | 9 |
| Handy-man Experiences | 3 |
| Citizenship | 9 |
| Vitalizing | 2 |
| Creative Self-expression | 7 |
| Constructive Thinking | 3 |
| Development of Work Habits | 3 |
| Development of Manipulative Skills | 6 |
| Health | 1 |
| Worthy Home Membership | 2 |

The authorities quoted are agreed on a certain few aims but each one has one or two suggestions typical to himself alone. Certain phases of several stated aims might be restated to agree with others, or perhaps they do agree in practice.

lative, and non-manipulative. The form designated as manipulative includes all manual processes, embracing any exercises introduced for the development of dexterity in the use of tools and other shop equipment. The aim is too often the only one associated with Industrial Arts by many educational administrators. The one named partially-manipulative correlates the function of the purely manipulative type with an analysis of trade processes and a study of tools, plans and constructions. The non-manipulative variety includes study of materials, their identification and use, appreciations, and exercises for formation of desirable conduct patterns such as courtesy, cleanliness, and orderliness. An ideal industrial-arts program is based on a consideration of all the different classifications of aims, and omission of any curtails results in the same proportion.

(a) The Aims of General Education -- Identifying the aims of Industrial Arts in the light of the universally accepted Cardinal Principles of

general education will further facilitate the interpretation of them. The aims of general education:

Health

Command of the Fundamental Processes

Worthy Home Membership

Vocation

Civic Education

Worthy Use of Leisure

Ethical Character

(b) Appreciation of Industrial Problems -- This aim is that of acquainting the boy with the problems of industry and labor, so that he will have a better understanding of the conditions under which industry operates and labor gains its livelihood. A boy must actually participate in the physical and mental activity of a shop to fully realize the purpose of this objective. Such an appreciation is valuable to any individual regardless of his vocation. The outcomes of this aim coincide with civic education.

(c) Consumer Knowledge and Appreciation -- This is an aim of the non-manipulative type, the pur-

pose of which is to acquaint the boy with standards by which he may choose, maintain, and appreciate commercially manufactured products. By it worthy home membership is furthered.

(e) Avocational -- While this aim is usually manipulative in nature, it might be classified as one of the other two types. Its effectiveness is dependent upon the number of activities included in a shop course because it acquaints the boy with industrial fields so that he may be able to choose a profitable method for spending his leisure time, either through actual participation in trade processes, or through the various appreciations. This avocational aspect of Industrial Arts pertains to worthy use of leisure time.

(f) Handy-man Experiences -- Manipulative in nature, this aim applies to the training of the boy to make any common needed repairs or alterations about the home. Its effect coincides with that of worthy home membership.

(g) Citizenship -- This aim is all-inclusive. It includes any directional teaching or concommitant

learning from an ideal situation which trains for participation in social, economic, or political affairs be these local, state-wide, national, or international in scope. Citizenship is synonymous with civic education.

(h) Vitalizing -- This aim is all-inclusive. It pertains to the influence Industrial Arts exerts toward enliving a curriculum in any school, either by direct correlation, or by contrast in type of activity with academic subjects. Very often it brings the first success to a boy who has difficulty assimilating academic presentations, and he is encouraged to extend his efforts to other fields thereby aiding him to gain additional successes. In this case shopwork is a means to an end rather than an end in itself, and therefore it can not be directly paralleled with any aim of general education; indirectly it contributes to command of fundamental processes.

(i) Creative Self-expression -- This is manipulative. It applies to the opportunity Industrial Arts presents to the boy for working out his original ideas; the boy can plan, draw, and construct the

project of his own choice. The finished project affords him satisfaction or dissatisfaction depending on the degree of perfection he attains. The nature of this aim coincides with that of ethical character.

(j) Constructive Thinking -- This aim is partially-manipulative. It means that the boy has a chance to design, construct, and finish a project of a tangible form. He plans successive steps, connecting each with the one preceding and succeeding it; at the completion of the article he can view the results of his work and recall the difficulties involved in constructing it. The outcomes of this objective are similar to those of ethical character and vocation.

(k) Development of Work Habits -- This aim is manipulative. It pertains to the learning of time-saving techniques in the use of shop equipment, and the training for habits of continuous and fruitful endeavor. It may be classed with ethical character, vocation and health.

(l) Development of Manipulative Skills -- This aim is manipulative. In the estimation of the boy

this is the most important objective of Industrial Arts. Boys desire very urgently to become proficient in the use of tools, and because of this trait they can be guided toward the acquiring of all allied benefits, and right conduct patterns. This objective forms a backbone for the course of study. Although it is not the most important outcome of the course, it is a means to an end, as well as an end in itself. It is allied to vocation.

(m) Aesthetic Appreciation -- This aim is non-manipulative in nature. It pertains to an appreciation of beauty in contour and finish, and perfection in construction. Conformance to accepted patterns of design with selection of suitable color schemes and appointments would also be included. It might be classified with worthy home membership.

(n) Other Aims -- One authority, Mr. William H. Mulvey, submitted without qualification the seven objectives of general education as his aims for Industrial Arts. Of these, health and worthy home membership have not been explained directly. Proper work habits in

conjunction with a proper code for life will insure health of mind and body. Worthy home membership, under various other classifications, has been interpreted in the foregoing paragraphs. The majority of projects made in any shop satisfy a need in some home. No better method can be devised for nurturing the love of one's home than by a system which presents an opportunity to supplement the equipment or comforts in that home. The most urgent desire of the average boy in a shop class is to construct some article needed by his mother, and a boy who has completed a project, and then presented it to his mother is, by that one act, a better citizen.

# SETTING OF PROBLEM

# AND

# PROCEDURE

# CHAPTER IV

## SETTING OF PROBLEM AND PROCEDURE

(1) Statement of the Problem -- Most of the authorities on Industrial Arts in this country credit the subject with being an aid to social betterment. They base their assumption on several commendable, later-life reactions of pupils who have been members of industrial-arts classes during their school careers.

(2) Purpose of the Study -- It is valuable to view the results attained through presentations of Industrial Arts in the Agawam High School to ascertain whether or not they compare favorably with those purported to be achievements of the country at large.

(3) The Town -- Agawam is one of the older Connecticut Valley towns. It was founded in 1635 and incorporated a township in 1855. Originally the industry was almost entirely agriculture, although one of the first sawmills of the section was located near one boundary of the town on the Agawam River. It has always been inhabited by thrifty people who have

maintained a high standard of living, and who have appreciated high quality, particularly in educational activities; it has never been considered a wealthy town, as judged by the present-day standards of our industrialized economic system.

At this time Agawam has a population of approximately 7500 people. Agriculture, in its various forms, is the most important industry. There are two mills, one devoted to the manufacture of woolen goods, and the other to certain types of paper. They employ a comparatively small proportion of the working population. During the last twenty years, because of the proximity of the town to larger centers, it has gradually evolved into a residential community and, accordingly, its population represents a rather broad cross-section of economic interests.

(4) The School -- The Agawam High School is a six year unit, including the seventh through the twelfth grades. The building was completed in 1922 and an addition erected in 1929. The planning and the construction were supervised by a farsighted, efficient

committee who appreciated the value of activities paralleling academic courses of study. They incorporated shops, domestic-arts rooms, gymnasiums, and other laboratory units, with liberal capacities and equipment. The school was organized by a progressive educator, Mr. Benjamin J. Phelps, the present superintendent of schools in the town. His ideal was a well-balanced program embracing a variety of approved educational presentations. The school was opened in September, 1928. Prior to this time Agawam pupils of high school grades had attended the schools of surrounding communities, and the mortality had been high. Increased interest in education at high school levels was evidenced to the extent of causing the need of an addition to the building when but seven years had elapsed.

(5) Physical Equipment for Industrial Arts -- The shop is spacious and well-lighted. It is generously equipped with hand tools and power machinery for learning processes involved in general woodworking, general bench metal work, mechanical draw-

ing, wood and metal finishing, and household repairs.

(6) The Shop Program -- The shop program of the new school, which was a pioneer effort of the town in that type of educational endeavor, was launched under ideal conditions. A few of the older boys had been members of shop classes in other schools but the younger boys were entirely unacquainted with any phase of the activities.

In the beginning all novices were given a problem to solve based on the fundamentals of industrial-arts work. As pupils became increasingly proficient, they were allowed to construct projects which were of their own choosing, and which challenged their varying degrees of efficiency. Boys have always been allowed to carry away their finished articles, if they pay for the materials involved. All pupils have been expected to work on equipment for the school when a need arises.

(7) The Problem -- A follow-up study of the boys who have been members of the industrial-arts classes in Agawam and who have been graduated

from the school with the purpose of evaluating the existing courses with a view toward revision.

(8) The Subjects -- Since the organization of the school many hundreds of boys have been graduated to take their places in the social and economic life of this and other communities. Of these boys, one hundred and thirty were approached for the purpose of this study. This group is a representative of the broad cross-section of the working population and of the graduation classes of past years.

(9) The Material -- A questionnaire of approximately fifty headings was used to collect the necessary information. Where ever possible the check-list method was used to insure uniformity of subject reaction. A copy of the questionnaire is found in Appendix 1.

(10) Procedure -- The following general steps were utilized in the procedure:

(a) Drawing up the questionnaire by means of;

x. Checking through textbooks and courses of study,

y. Consultations with industrial-arts teachers,

(b) Administering the questionnaire by;

x. Personal interview,

y. By relatives or friends in the present industrial-arts classes,

(c) Tabulation of returns from the questionnaire;

(d) Interpretation of results in the light of present school practices and stated objectives.

The results of the questionnaire response are found in the following chapter.

# R E S U L T S

# O F

# Q U E S T I O N N A I R E

# CHAPTER V

## RESULTS OF QUESTIONNAIRE

In order that the reader may get a clearer picture of the responses from the questionnaires the results are given below, under appropriate headings. First, however, the representative nature of the sampling of boys is considered.

(1) Variety of Graduating Classes -- Since the effectiveness of a survey depends upon the variety of its sampling, the year of graduation must be considered. This is made necessary by the various economic conditions facing the boys in various years.

(2) Boys Selected for Survey -- Graduates who lived and worked in the vicinity of Agawam since leaving high school, or those boys who had been away for a short period of years but who had not severed their ties to Agawam were chosen for this survey. The reason for such a choice was because they have faced the social and economic problems that the school had attempted to prepare them to solve.

The number of questionnaires returned from each graduating class is found in Table II.

TABLE II

Number of Questionnaire Returns From the Several Graduating Classes

| Year of Graduation | Number of Returns |
|---|---|
| 1924 | 3 |
| 1925 | 3 |
| 1926 | 7 |
| 1927 | 3 |
| 1928 | 7 |
| 1929 | 6 |
| 1930 | 8 |
| 1931 | 6 |
| 1932 | 9 |
| 1933 | 13 |
| 1934 | 10 |
| 1935 | 10 |
| 1936 | 11 |
| 1937 | 12 |
| 1938 | 11 |
| 1939 | 11 |

The figures are significant because they show a sampling of every class graduated from Agawam High School since its organization. They are a fair index to the proportionate size of the classes.

(3) Choice of Curricula -- Interests of the selected groups of boys are typified to a great extent by their school careers. The frequency of their choices in the designated three courses[24] offered by the school is found in Table III.

TABLE III

Respective Curricular Choices of the Several Boys Considered in This Survey

| Name of Curriculum | Frequency |
|---|---|
| General | 83 |
| Commercial | 18 |
| College | 29 |

The General Curriculum was the most popular choice, with the College and Commercial Curricula placing second and third respectively. The proportion approximates that of the whole school.

[24] Boys enrolled in the Agriculture course are not included in this survey as they received a special type of shop training.

(4) Grades of Achievement in Academic Subjects -- Academic grades are the criteria by which all school success has been judged throughout the years of formal education . A tabulation of academic levels for these boys is found in Table IV.

TABLE IV

Number of Boys in Each Achievement Interval of Academic Success

| Interval | Frequency |
|---|---|
| High | 26 |
| Average | 65 |
| Low | 39 |

The intervals (high, average, low) are based on a cross-section of the whole school. The larger percentage of this group is in the average interval, the low interval being second, and the high interval, third.

(5) Grades of Achievement in Industrial Arts -- The value of Industrial Arts to a boy is largely dependent upon his success in accomplishing the aims thereof. Marks of achievement, being the index of success, must be given consideration in any survey. The range of industrial-arts marks is found in Table V.

TABLE V

Number of Boys in Each Achievement Interval of Success for Industrial Arts

| Interval | Frequency |
|---|---|
| High | 48 |
| Average | 62 |
| Low | 20 |

The intervals (high, average, low) are based on a cross-section of all the boys in the school in Industrial Arts. The larger percentage is in the average interval, the next in sequence is the high, and the smallest percentage is the low one.

(6) Respective Number of Years the Several Boys Elected Industrial Arts -- The effectiveness of any subject, and the results achieved by participation in it may be measured by the number who re-elect that subject. Membership in the industrial-arts classes has been compulsory during the two-year junior high school period, and optional during the four-year senior high school period. The number of senior high school elections is shown in Table VI.

TABLE VI

Number of Years Individuals Were Members of the Industrial-arts Class in Senior High School

| Number of Years | Frequency |
|---|---|
| 1 | 30 |
| 2 | 42 |
| 3 | 23 |
| 4 | 35 |

The largest number of boys elected the subject for two years, with four years, one and three as the next choices respectively.

(7) General Interests of the Group -- Most boys have an interest outside of their accepted vocations -- avocations which relieve the monotony of everyday life. The interests of this group are tabulated in Table VII.

TABLE VII

General Avocational Interests of the Several Boys and the Frequency of Their Choices

| Avocation | Frequency |
|---|---|
| Sports | 84 |
| Reading | 38 |
| Mechanics | 36 |
| Others | 22 |

A large majority of the boys chose sports as their avocational interest. Reading and mechanics were selected by a much smaller, but almost identical number of boys for second and third choices respectively. Other interests consisted of collecting stamps or coins, music, dramatics, and animal breeding. Some boys indicated two or more choices.

(8) Phases of Industrial Arts Found Interesting by the Various Individuals -- Industrial Arts embraces many activities, all of which are included in a complete program. It would be impractical for a school of the type and size of the Agawam High School to provide for a full industrial-arts program. Accordingly phases of the work purported to have the greatest educational value were chosen, and provision made for them.

Boys do not have identical interests, nor do they have equal success in all types of industrial work. Consequently, individuals favor one or two sub-divisions of the work, and partially or wholly exclude the remainder.

This question is most valuable because the answers are based on a review in retrospect which includes not only the time spent in school, but also that which has elapsed since graduation. The data herein compiled forms an authentic basis for curricula revision.

The choices with the number concerned are listed in Table VIII.

## TABLE VIII

Shop Activities Selected as Being of Most Interest to the Several Boys and the Frequency of Their Choices

| Name of Activity | Frequency |
|---|---|
| Woodwork | 81 |
| Mechanical Drawing | 28 |
| Sheet Metal | 9 |
| Machine Work | 20 |
| Woodturning | 29 |
| Electricity | 15 |
| Household Repairs | 15 |
| Woodfinishing (Painting) | 18 |

Woodwork was selected as being of the most interest to a very large majority. The other activities ranged approximately in the order of their importance, as judged by the amount of time devoted to them at their original presentation.

(9) Activities Used Since Graduation From School -- Testing immediate interest and values of school presentations through use of a series of problems of progressively increasing difficulty is a comparatively simple task. But the results of such tests are not so useful for a revision of the course of study as an evaluation of the carry-over or after-school benefits of an educational program. Accordingly, it is desirable to ascertain not only the number of boys using any phase of shopwork, but also the frequency of its use since their graduation. From such a study certain unused activities may be eliminated. A compilation of the study may be found in Table IX.

Woodwork was selected as being the most used phases of shopwork. In some cases Woodwork would overlap the domain allotted to some other activity, particularly that of Household Repairs. Woodfinishing includes, among other skills, all forms of painting. Household Repairs includes any form of restoration in the home by use of any material.

TABLE IX

Frequency of Use for the Various Industrial-arts Activities Since Graduation from School

| Name of Activity | Frequency of Use |
|---|---|
| Woodwork | 45 |
| Mechanical Drawing | 6 |
| Machine Work | 14 |
| Woodturning | 6 |
| Electrical | 16 |
| Household Repairs | 37 |
| Woodfinishing (Painting) | 35 |
| Sheet Metal | 7 |
| None | 17 |

(10) Other Uses of Industrial Arts Since Graduation from School -- Table IX shows the number who benefited by using the knowledge or manipulative skill learned in industrial-arts classes, and the special acquisitions that they found advantageous. Almost as important are certain other uses of Industrial Arts and the reasons for the boys' use of these attainments. The various conditions under which shop practices were used are listed in Table X.

TABLE X

Reasons and Frequency for After School Use of Knowledge and Skill Acquired in Shop Classes

| Uses | Frequency |
|---|---|
| Knowledge of Trade to Start | 20 |
| Insight Into Various Trades | 10 |
| How to Make a Wise Choice | 14 |
| Insight Into Various Skills | 10 |
| Aid to Actual Trade Skills | 15 |
| Shop Atmosphere | 82 |
| Model Making | 15 |
| Knowledge of Trade Skills | 12 |
| Adjustment to Shop Conditions | 30 |
| Theory Behind Operations | 11 |
| Home Workshop | 47 |
| Major Repairs (Wood) | 27 |
| Major Repairs (Metal) | 1 |
| Minor Repairs (Wood) | 62 |
| Minor Repairs (Metal) | 8 |
| New Building | 13 |
| Cooperation With Son or Daughter | 1 |
| Vocational | 6 |

It is significant to note that Minor Repairs, Home Workshop, Shop Atmosphere and Major Repairs were selected most often, in the order of this listing. These titles denote non-industrial or cultural use for attainments acquired from shopwork. Items such as Knowledge of Actual Trade Skills and others, denoting professional or industrial use for the attainments, received fewer votes. How to Make a Wise Choice of Furniture would most likely be used only by a young man who had married. Therefore, the frequency is low proportionately, because the number of such men in this group is low.

(11) Education Beyond High School -- It is necessary to know what schools the boys attended after graduation from high school in order to learn whether or not they sought courses which could have been feasibly included in the high school curricula and to check on the type of school chosen by them so that preparatory courses might be organized if necessary. The results of this question are found in Table XI.

TABLE XI

Types of Schools Attended by the Group After Their Graduation from High School

| Type of School | Frequency |
|---|---|
| Industrial School | 10 |
| College | 30 |
| Business School | 4 |
| Evening Classes | 16 |
| None | 78 |

The largest group did not avail themselves of any type of education after leaving high school. The next larger group went to college; the percentage of this group is abnormally large. The frequency of those going to an industrial school and evening classes is low because of the difficulty accompanying such attendance.

(12) Desire for Additional Courses -- It is valuable to know whether or not there was a desire for additional courses and, if so, what courses were demanded. Courses for which there is a

popular demand might be added to the curriculum or substituted in place of some being presented. The data on this question is shown in Table XII.

TABLE XII

Courses Requested in Addition to Curriculum Studied in High School

| Type of Course | Frequency |
|---|---|
| Business | 31 |
| Industrial | 39 |
| Cultural | 5 |
| Professional | 10 |
| Agriculture | 10 |

The larger group desired industrial courses, mainly, different forms of machine metal work because there are jobs available at this time for trained machinists. The next larger group desired business training. They are the students who participated in a cultural curriculum and now think that a business

training would help them in their work. Those seeking professional training are boys who have graduated from college or are now attending one. Boys working on farms desired training in some form of agriculture. The smallest group sought cultural courses.

(13) Reasons for Leaving Occupations -- Education should help individuals to adjust themselves to, and content themselves with their environment, including among other things their vocational surroundings. One function of Industrial Arts, as an integral part of the educational scheme, is that of orienting the boy vocationally. That is one aim of the industrial-arts program in Agawam, although it is limited to the fields presented. The survey on stability of employment is summed up in Table XIII.

In this table it will be found that the largest percentage leaving positions of employment did so because they were able to better themselves economically. The next group in sequence left their positions because the wages were too low. The latter group is identical with the former group in some instances. A still smaller group left their work because they disliked it.

A few disliked their employer. A small proportion lost their positions because the work was seasonable in nature or because the work ceased entirely. The majority are holding their original positions.

TABLE XIII

Reasons Advanced for Leaving Positions of Employment and the Frequency of Occurence

| Reasons | Frequency |
|---|---|
| Promotion | 32 |
| Dislike of Work | 17 |
| Wages Too Low | 20 |
| Dislike of Employer | 4 |
| Seasonable Lay-off | 11 |
| Original Position | 50 |

(14) Questions Not Tabulated -- There were other questions included in the questionnaire, but the answers to them appeared to have little bearing on the compiled data and were so widely varied, that they did not warrant tabulation. However, they are valuable

enough for comment.

Place of birth of the individual boys appeared to have no noticeable effect on their reactions. It was interesting to note, however, that the majority were born in Agawam, and had not interrupted their period of residence in the town.

The larger percentage of the boys did not engage in the vocations of their fathers. Farmers' sons were the exception; a number of them worked with their fathers on the home farm.

The father's birthplace seemingly had no effect on the boy's economic or social life. A large percentage of the fathers were born in Agawam and have lived in the town since that time.

(15) General Comments On Data Compiled From Questionnaire[25] -- There was no attempt made to distribute a definite proportion of the questionnaires to the members of the various classes but the returns showed a scattering which was proportionate, in most cases, to the membership of the classes at the time of graduation.

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[25] The following is based on informal deduction from the results of the questionnaire.

The choice of curricula in school had no noticeable effect on the occupation in which the individual engaged after graduation, nor on his success in that occupation. Boys graduating from the College and General Curricula entered business immediately after graduation and were successful to the extent of being promoted and remaining with their original employers. However, most boys who studied the subjects of the College Curriculum had the opinion that they would have been more successful if they had pursued a purely vocational program of studies.

No rule regarding comparison of academic and industrial subject grades could be formulated. It was apparent from this survey that there was no common bond between them. It is generally conceded that shop teachers' grades average higher than those of academic teachers, and that assumption was confirmed in this study.

Attendance in industrial-arts classes is compulsory for junior high school pupils; it is

thought that training in the fundamentals of industrial work is desirable for all boys. Machine work is presented during the first year of senior high school and its election is almost unanimous; boys are thrilled by work on any type of machine. During the first year the results of their work are comparatively crude because they are unable in so short a time to master the manipulative skill involved. Accordingly, the majority wish to return and profit by their year of practice because it renders them capable of constructing a worth-while project. The greatest number elect Industrial Arts for two years. Boys desiring the work for a greater number of years are usually interested in one particular phase of the work and specialize in that phase.

Few boys are not interested in sports -- their love of play is due to a social heritage dating back to the beginning of known history. The boys returning these questionnaires conformed to the universal pattern, the largest percentage choosing sports as their greatest interest. To be actively interested

in mechanics one must have a certain amount of equipment for experimentation, and boys who did not have access to any type of shop facility would in consequence be turned to another avocation.

Reading, as interpreted by this group, included a wide range of types. Some confined their reading to newspapers. Others read all offerings on the vocation or avocation of their choice. A large proportion read anything available, without discrimination. Some had other choices.

The survey indicated that woodwork was the activity chosen as being most interesting by the greatest number. Wood is a medium which has always had the greatest and most varied number of uses, universally, throughout the ages. It is the most easily worked of materials for school shop activity, and, in consequence, it is more widely accepted as a basis for shop work. Very naturally woodwork was the phase of shop work most used after graduation, most houses and their furnishings being constructed of wood. Popularity of choice among the other activities was about in

proportion to their prominence in the course of study. Mechanical Drawing was the least popular of the activities and was the least used after graduation. Its use was confined mainly to college requirements. Electrical practice and sheetmetal construction received slight mention and a like amount of use. The fields embraced by the latter activities are narrow. Machine work limits itself, through the equipment required, almost entirely to vocational pursuits. Repairs and Woodfinishing, heartily disliked as classwork were much used outside of school; there is always painting and repairing to be done about the home.

A large number signified a desire for additional courses of a vocational nature, particularly in machine-shop practice. At this time there is a great demand for skilled machinists, and the boys assumed that if they were qualified to accept jobs of such type they would receive one immediately. A slightly smaller group sought courses in office practice for vocational advancement. Comparatively few wished to participate in classes of a cultural

value and, of these, the majority were olfer graduates who were beginning to realize that it was important to know how to spend leisure time profitably.

A large number of boys were holding positions with their original employers. Of these the greatest number had been members of the earliest and latest graduating classes; the intermediate classes appeared not to be so stable in their employment. Perhaps this was due to the general instability of employment during those several years. An insignificant few left positions because they disliked the work or the pay was too small. None of them were openly resentful of this economic situation; all were content or cheerfully hopeful of a promotion.

All were solicitous for the welfare of the school and profuse in their declarations of appreciation for the benefits derived from attendance thereof. Interest in the athletic teams and results of other extra-curricular activities was evidenced by all. Such interests outlast those related directly with curricula.

# CONCLUSIONS REGARDING

# INDUSTRIAL ARTS

# CHAPTER VI

## CONCLUSIONS REGARDING INDUSTRIAL ARTS

It is desirable to compare the data obtained from the questionnaire, which portrayed the later-life benefits acquired from Industrial Arts, as it is presented in Agawam, with the benefits listed by the several authorities on the subject.

(1) Appreciation of Industrial Problems -- The outcomes of this aim are very desirable but difficult to realize as they can not be taught by objective methods only. One acquires an appreciation of industrial problems through actual physical and mental participation in the activity of a school shop which is organized to parallel, as nearly as is practical, a commercial shop.

Any boy working on a project in the school shop cannot avoid appreciating the patience, vast amount of knowledge, and high degree of tool execution necessary to be a proficient tradesman. He cannot help but realize the long period of practice which precedes the mastery of trade technique.

At Agawam consideration has always been given to this objective; tool technique taught. language and terms used, methods for material storage, methods for tool care, arrangement of shop, care of shop, and every direct and concomitant learning have conformed to commercial standards. The shop atmosphere should be condusive to ideal reactions of this type.

In the questionnaire, under item, Shop Atmosphere, there were eighty-two boys who affirmed their desirable reactions and, under the item, Adjustment to Shop Conditions, twenty affirmed their similar reactions. The total of both is one hundred and two, a very large majority. An indirect proof might be the fact that fifty boys are employed in their original positions, few of the others left positions for reasons detrimental to themselves, and a limited number volunteered the information that they developed an appreciation of shop atmosphere which was valuable to shape their attitudes toward tradesmen with whom they have contact.

(2) Exploration -- The outcomes of this aim

are directly dependent on the range of industrial activities presented in the shop program. It is desirable to have a large variety of such activities so appeal may be made to a correspondingly large number of interests and aptitudes, thereby benefiting a proportionate number of boys. Unfortunately, each activity requires a certain amount of room space and equipment, the cost of which is often prohibitive. The city schools favor this aim because their enrollments are large, and interests are more varied in proportion to the size of the group. Also, a city school's per-pupil budget is liberal, so that the expense involved is no consideration. In the case of the smaller towns the opposite is true; the space is limited, the group lesser in number, and the per-pupil appropriation is smaller. In Agawam the shop is organized on the so-called general-shop basis and the number of activities is limited, as judged by the similar installations in the schools of the county at large. Accordingly the opportunity for presentation of the exploratory ideal is limited. The questionnaire con-

firms the prevailing conditions; only ten boys admitted having received benefit from this source, which was listed as Insight into Various Trades. It might be of advantage to supplement the present shop courses with a series of lectures regarding trade activities not otherwise presented.

(3) Consumer Knowledge and Appreciation -- This aim ranked very high in the collective estimation of the authorities. Media and methods of fabrication vary according to usuage of the finished article; therefore, knowledge of construction, finish, and materials facilitate the choosing of commercially produced articles of types identical to or allied to these studies.

The reactions from this aim are very desirable but are limited to the number of fields in Industrial Arts studied by the boy. In addition, substances used in the construction of commonly sold household equipment vary with technological progress, and methods of fabrication change correspondingly; thus increasing the difficulty of training for the

outcomes of this objective. Also, its value would be confined to the use that the boy might have for the knowledge thus gained. Boys who have no reason for buying household equipment would derive no benefit from experience in consumer science.

Although the boys included in this survey received only a limited amount of training for the buying of consumer goods in general, they should have been able to make a wise choice in the purchasing of products made of wood; a large part of class time was devoted to the study of wood construction, including types of joints, the most popular methods for fabrication and the many adaptations for use of such methods ideally. The boys have studied the various finishes for wood and metal, including the occasions for their uses, and have applied them under ordinary conditions.

By additional industrial courses and the presentation of correlated information, the furtherance of consumer knowledge at Agawam might be nurtured. There were fourteen who responded affirmatively

on this question.

(4) Avocational -- This aim was unanimously chosen by the authorities. Need of training for leisure time is becoming increasingly necessary in direct proportion to the decrease of working hours in all industrial pursuits. The outcome from this aim is dependent not only on the number of industrial activities presented but also on the program for each activity; it is necessary that a portion of all shop teaching be directional toward recognition of hobby interests.

The number of fields presented at Agawam is limited, but a hobby program, classified as such is featured; certain projects which are so designed that only a small equipment is necessary for their construction are grouped for display before the classes. All boys whether under-graduates or graduates, are urged to carry home any plans which appeal to them, or avail themselves of all opportunities offered in the shop toward that end. Many boys continually seek such data coinciding with their individual interests.

Training at Agawam in keeping with the motive

for this aim could be broadened by the introduction of a larger variety of arts courses. Confirmation of the present set-up, as evidenced by the questionnaire, justified a pride in its effectiveness within its limits. Forty-seven boys had interested themselves in Home Workshops, and fifteen favored Model Making, eighty-nine checked Repairs, any of which may have been in line with this objective.

(5) Handy-man Experiences -- That only four of the authorities signified approval for this aim was surprising to note, because the boys of Agawam, graduates and under-graduates alike, consider activities toward its end very valuable and interesting. The difference in opinion may be due to the fact that the authorities are from cities. People in the smaller towns would be more appreciative of the value of handy-man experiences because a majority of them live in single houses, very often owned by their families and therefore they do their own maintenance work, while the city dweller resides in apartment or tenement, more often owned and maintained by a syndicate. The

former group would be more conscious than the latter of the need for ability to accomplish various household repairs. Agawam High School includes a course in Handy-man Experiences in its shop curriculum. The course embraces all practical repairs within the scope of the shop equipment, and the pupils' ability. The results of the questionnaire attest to the success of the course; twenty-eight checked Major Repairs and seventy checked Minor Repairs. In most cases the repairs were made about the homes, and included the several fields presented in the shop. Additional fields of endeavor would broaden the scope of the outcomes.

(6) Citizenship -- Universally chosen as an ideal, not only of Industrial Arts, but of all education. Yet, citizenship is very difficult to define, and more difficult to test as a reaction from a specific learning process. The whole environment of a young person, including direct and concomitant learnings from school and all other sources, influences his civic progress, beneficially or detrimentally, and very often outward signs cannot be interpreted cor-

rectly.

All of the young men who were interviewed have persisted in remaining in school during the required time necessary to receive a diploma, and so have formed conduct patterns resulting from conformance to the restrictions and regulations continually enforced by the school administration. They have worked in the school shop to complete articles which later were carried to their homes, all have assisted in the construction of some variety of school equipment which benefited the entire student personnel. With few exceptions they have worked to the best of their several capabilities while in the shop, but in all cases they have abided by the rules thereof regarding neatness, precision, and orderliness.

Since graduation several have continued their education. Nearly all have held positions conscientiously, in fifty cases remaining in the original one for periods up to seventeen years. The majority have acquired avocations not harmful to society, and are happy and ambitious. None have been detected committing an

illegal act. From all outward appearances they are good citizens.

(7) Vitalizing -- This aim has no direct carry-over reaction. It might be tested more readily in school, yet under some conditions such testing would present a problem even at that time. In Agawam direct correlation between subjects has been introduced only in the most limited form. Industrial Arts has been used as a basis for problems in Arithmetic, English Composition, and Geography, but only on occasion. Accordingly no positive test can be made.

Attendance in industrial-arts classes vitalizes a program because the type of activity is so different from that presented in academic classes that it rests and invigorates the pupil, rendering him more capable of carrying on the work presented in the class following.

A system of direct correlation, wherein the academic work is enlivened and made more concrete, should be of value in the school.

(8) Creative Self-expression -- A majority

of the authorities affirmed this aim. The outcomes of it are very desirable and worth-while, because Industrial Arts presents one of the few opportunities in an educational program for a boy to see his original ideas materialize into a form that may be subjected to analysis and evaluation.

Ideally a boy realizes the need of an article which he is capable of making. He searches through the books, magazines, catalogues, and such material for suggestive ideas suitable to the surroundings and the use of the article in question. When he secures a desirable suggestion, he starts a creation of his own design, keeping in mind the relative size, type of construction, and the principles outlined in Aesthetic Appreciation. He plans. draws, constructs, and finishes his project, constantly forming judgement, solving problems, and compiling knowledge, all of which he will view in retrospect when he evaluates his finished product. The instructor should guide him carefully throughout the whole process.

Suggestive plans and pictures of many varieties

of typical projects are filed for reference in the Agawam school shop. Boys are encouraged and aided to complete each progressive step successfully and painstakingly. But, because of limited equipment for drawing, that phase of action is curtailed correspondingly.

(9) Constructive Thinking -- Very often adolescents do not have a serious purpose behind their school work because they cannot visualize the ultimate values of abstract presentation. Accordingly, they do not extend themselves to the limit of their mental endowments, and particularly they fail to engage in any original research.

Under ideal conditions, Industrial Arts presentations constantly challenge the resourcefulness and ingenuity of the class members. Industrial activities, then, should never become theoretical abstractions but should retain their concrete aspect. Therefore the single choice method of teaching, wherein all members of the class are compelled to make articles of identical design, construction, and

finish should never be used except during preliminary class work. Such a method does not develop in initiative or reasoning power; it is related entirely to the manipulative aspect of the subject because it narrows the scope of the pupils' activity, and it becomes decidedly unpopular as the pupils grow mentally, Tangible results spur boys on to greater mental effort, thereby, capitalizing upon latent capacities.

The boys interrogated by this survey were taught shopwork through use of the "project method" wherein each was allowed the greatest possible latitude for development of originality and initiative. Throughout the course they were counseled and guided to analyze processes and reason deductively from the results that they achieved, and as a result they become reasonably proficient in the art on constructive thinking.

From all measurable results, in keeping with the outcomes attributed to this aim, one may deduce that the method of teaching used in the shop was

reasonably successful. However, constructive thinking might be further stimulated by correlation between Industrial Arts and other subjects; concrete objectives would set up and additional benefit might be derived from all subjects.

(10) Development of Work Habits -- Few of the authorities chose this aim, a surprising revelation, because Industrial Arts is well adapted to training for habitual deligence in employment. Shopwork is partially physical in character; accordingly teachers have little difficulty detecting faulty work habits or failure to work, and they can introduce corrective measures to circumvent such abuses.

Cognizance has always been given to this aim in Agawam. From their first day in the shop, boys are taught the value of uninterrupted labor during all the time apportioned for it, and they are guided toward the development of wholesome attitudes and worthy ideals toward work.

(11) Development of Manipulative Skills -- A large majority of the authorities affirmed their appre-

ciation of the valuable outcomes from this aim. In the estimation of the boy, learnings from all industrial-arts activities are directional to this objective. The administrator feels that the opposite is true; development of manipulative skills is but a means to an end. Either deduction might be true, but both factions concede that without this learning there would be no incentive for the others; all the others are achieved because of the desire for this one. Accordingly, mastery of operations is valuable as a means to an end and as an end in itself.

In Agawam a series of typical projects were constructed, decorated artistically, and displayed for the inspection of the boys. These articles were designed with consideration for the boys' varied capabilities. Therefore the set of models was an inspiration for the acquiring of manipulative skills, and by virtue of that inspiration other desirable learnings were presented with success; the policy appeared to be successful enough to warrant a continuance of it. An increase in the number of models

with corresponding appeal to additional interests, might insure success in a great number of cases.

(13) Aesthetic Appreciation -- Also confirmed by a large majority of the authorities, aesthetic appreciation is an objective of great value; industry as a whole has become conscious of beauty in design and contour. No longer is the serving of a utilitarian purpose enough; there must also be an appeal to the aesthetic sense. Industrial Arts presents one of the few avenues in the modern educational organization for fostering of this desirable aim, and industrial-arts teaching must be directional toward this end or fulfillment of the mission will not be consummated. Architectural and cabinet design and construction are inseparable; both must be given consideration at all times because the strength of a construction is dependent upon the lines of delineation.

The teaching in Agawam always has been directional toward this aim. Boys plan their own projects, and during the whole process they are guided

constantly toward consideration for contours conducive to both beauty and strength. Their finished product has been checked not only for sturdiness, but symmetry as well. The results of such teaching could best be tested during class time.

The most effective test for reaction to this aim was an objective test made immediately after the completion of each project, and on each of such occasions the results of the directional teaching was clearly in evidence. Inspection of articles made after graduation, in home workshops, was the test next in effectiveness, but this one was limited to the few articles obtainable, and the results here noted were reasonably suggestive of training in artistic appreciation.

Benefit from this aim would be increased by direct correlation with the fine arts department. Through such cooperation designs other than those used in actual construction might be displayed, drawn or studied, thereby presenting a wider variety than is posible under the present organization.

(13) Aims Receiving Minor Consideration -- There were two aims chosen by two of the authorities. Both of them are listed among the objectives of general education, and as industrial-arts activities are considered an integral part of the whole scheme, these should receive at least, limited consideration.

The first one listed is health, a very important aim of all education because of its far-reaching effect. Originally, in the school of Fellenburg, the values of Industrial Arts were considered comparable to those now attributed to physical education; the subject was introduced for the purpose of providing exercise for the boys, as a relief from the academic subject which included no physical activity, and it was considered effective in that capacity. It remains as beneficial now judged from the same angle. An allied benefit from it is the ensuing formation of proper work habits. Another coincidental but indirect value in Agawam is due to the shop's output of playground equipment. Each year a large amount of health-giving apparatus is constructed in the shop, and distributed to the

several playgrounds for use during the vacation period.

The second aim is worthy home membership, also important, but so broad in scope that it includes many of the other aims. Industrial Arts, more than any other subject in the school curricula, furthers the outcomes of this objective. The larger majority of the articles made in the school shop go into the homes of the community supporting that school; every mental or physical effort involved in the completion of these articles strengthens a boy's love for his home, resulting in unavoidable proper mental patterns regarding that home.

In Agawam boys have always been urged to build for their homes. A view of the numerous comforts made in the school shop which are included in the furnishings of these boys' homes strengthens one's faith in the opinion that these boys have realized this objective.

(14) General Conclusions -- Industrial Arts must aid boys in acquiring the ability to appraise things for both the obvious as well as the hidden

values, and it provides them with a degree of manipulative dexterity that will enable them to be at least partially self-reliant.

From this study it seems rationable to deduce that the industrial-arts program in Agawam, within the boundaries imposed by the limited number of activities, is reasonably successful as it exists in its present form. Boys graduating from the school display all the appearances of having acquired the desirable traits purported by the authorities to be those of greatest value from the subject.

Consensus of authoritative opinion pertaining to Industrial Arts verifies a trend toward objectives of a cultural nature, in lieu of those purely vocational in character. Such a tendency is in keeping with the generally accepted theory that the subject is an integral part of general education, rather than a supplement to its specific training in certain designated fields.

The industrial-arts course of study for Agawam High School has been shaped in accordance with

that view, and the questionnaire attested to this condition. The individual aims promulgated by the industrial-arts course of study at this school coincided with those sanctioned by the authorities in the majority of instances.

The plan in Agawam deviates from that advocated by the authors studied in the in the emphasis placed on certain aims; Handy-man Experiences, Constructive Thinking, and Development of Work Habits were considered of sufficient value to mention by only three of the authorities, but they have been emphasized continually in this school, and they have been very popular. Handy-man Experiences would be more effective in a small town such as Agawam than it would be in a city which the authorities represented. There appears to be no reason for the unpopularity of the other two mentioned above; both direct worthy reactions, but they might have been included within the scope of another aim.

Exploration is another type of deviation. In this case the situation is reversed; a small school has too few activities for proper presentation of this aim

while the larger city schools can do it efficiently.

The program at this school would be strengthened by two procedures; first, since the results from certain aims were curtailed by the lack of sufficient activities for full presentations, additional industrial fields should be introduced; since it is desirable to bring about a broader coverage of the various phases of shop-work by association with the several academic subjects. Industrial Arts, then, should be correlated with the various other subjects of the curriculum.

Specific recommendations for the improvement of Agawam's program will be found in Chapter VII.

# RECOMMENDATIONS REGARDING

# INDUSTRIAL ARTS

# CHAPTER VII

## RECOMMENDATIONS REGARDING INDUSTRIAL ARTS

A survey is only an appraisal of the conditions of the field it examines, and in itself has no value. Its usefulness is derived from recommendations regarding faults or weaknesses that it discloses. This survey, while it revealed but few errors of omission or judgement, would be worthless without accompanying suggestions for improvement.

(1) Suggestions for Immediate Improvement of the Industrial-arts Program -- Failure to enlarge the budget to provide for additional tools usually precludes the purchasing of supplementary equipment for this department. Accordingly any new installation could entail only a small expenditure.

A limited course in ceramics would require little additional equipment, and would foster exploratory, avocational and aesthetic benefits.

The program in mechanical drawing might be expanded; mechanics do too little original planning. Only a small number of instruments would be necessary. Constructive thinking and creative self-expression would

be furthered.

Artcraft work has never been attempted in this school. Each activity would require only a small variety of tools, the aggregate cost of which would be comparatively low. There are many ramifications of this subject, including leather tooling, sheetmetal spinning and shaping, working with celluloid compositions, and jewelry making. It would contribute to aesthetic appreciation, avocation, and exploration, directly, and other objectives, indirectly.

Another activity which has been given too little consideration in Agawam is woodcarving. Carving tools of the sort adaptable to school work are comparatively inexpensive; one or two sets would suffice at the beginning. This activity would intensify the reactions from aesthetic appreciation and avocation.

(2) Suggestions for Future Improvement of the Industrial-arts Program -- School administrators' ambition or schemes for department betterment are very often thwarted by a reduced budget, and they postpone

innovations until future dates. Such a situation exists in this system, but it is hoped that conditions will improve and full-sized budgets will again prevail.

Installation of equipment for printing would be very valuable to this department. The benefits resulting from the teaching of that subject are many. Its reactions coincide with those attributed to exploration, manipulative skills, and aesthetic appreciation, directly and command of fundamental processes, indirectly.

Great profit would be received from the use of metal machine shop equipment, particularly an engine lathe. At the present time there is a dearth of skilled machinists, and any young man who has had the most meager training is able to find employment; in this instance vocational training is advisable. Machine shop practice contributes to exploration, also.

Addition of a forge would complete the facilities for the presenting of general metal work and would round out the whole general shop layout. It

would strengthen the reaction from Handy-man Experiences and Exploration.

Because many boys do not spend enough time in the shop to profit by the full program, the minimum number of periods of school time devoted to the subject should be increased.

This study has made a valuable contribution to Agawam High School. It has analyzed the offerings of the industrial-arts course, illuminated commendable features along with those deserving of criticism, with reference to the aims of general education, and those only identified with Industrial Arts. It has strengthened beliefs which it proved correct, and magnified for revision contentions which were incorrect; withal it has benefited the school beyond estimation.

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# APPENDIX

# QUESTIONNAIRE

Kindly check your choice or write in your answer.

Name_____

Year of graduation_____ Curricula_____

Grades in academic subjects
( )High
( )Average
( )Low

Grades in industrial arts
( )High
( )Average
( )Low

Years of industrial arts
( )Jr. High
( )Sr. High

General interests
( )Reading
( )Sports
( )Mechanics

Phase of industrial arts of most interest
( )Woodwork
( )Mechanical drawing
( )Sheetmetal
( )Machine work
( )Woodturning
( )Electrical
( )Repairs
( )Woodfinishing

Which have you used most since graduating?_____Least?_____

Education beyond high school
( )Industrial school
( )College
( )Business school
( )Evening classes
( )Would you like some further course
In what? _____

Why do you need these?_____

Present occupation_____

Previous occupations
_____
_____
_____
_____

Reasons for leaving
( )Promotion
( )Dislike of work
( )Wages too low
( )Dislike of employer

Time of service in each occupation 1. 2. 3. 4. 5.

Use of industrial arts
( )Knowledge of trade to start
( )Insight into various trades
( )How to make a wise choice
( )Insight into various skills
( )Aid to actual trade skills
( )Shop atmosphere
( )Model making
( ) Knowledge of actual trade skills
( )Adjustment to shop conditions
( )Theory behind operations
( )Home workshop
( )Major repairs( )Wood( )New
( )Minor repairs( )Metal Building
( )Cooperation with son or daughter

Vocational advancement_____

Birthplace_____ Birthplace of father_____

Occupation of father_____ Previous occupation of father

Remarks_____ _____

_____ _____

Suggestions_____

_____

_____

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Approved by:

Albert W Purves

E J Dennen

O L Clark

Thesis Committee

Date _____